

The commissioners for visiting the Universities of Scotland, remark in their report "that it is desirable that graduates in medicine should have that degree of literary and scientific attainment which will prevent them when mingling as they must do with mankind, in the exercise of their profession, from being looked upon with contempt; or from committing errors in conversation and in writing, for which others would be despised; because even upon the supposition that they have high professional acquisitions, the law of association will operate, and the conclusion will be drawn that much confidence cannot be placed in them." The value of university training was strongly insisted on by the late Prof. Edward Forbes, when speaking of the relation which scientific studies bear to medicine. The following are his remarks:—"It is the training of the mind in correct methods of observation that gives the Natural History Sciences so much value as instruments for preparation in professional education. Not unfrequently do we hear the short-sighted and narrow-minded ask—what is the use of zoology or botany or geology to the physician and surgeon? what have they to do with beasts or plants or stones? Is not their work among men healing the sick? Of what use save as remedies, are the creeping things, or the grass that grows upon the earth, or the minerals in the rock? Vain and stupid questions all—yet they are sometimes put by persons who profess to promote the spread of education. They want something, but the best of them mistake the end for the means. The best want knowledge, but have not learnt that the mind must be trained ere it is prepared to gather and digest knowledge. They want science, but science turns mouldy and unwholesome in our unprepared mind. They forget or do not know that education consists chiefly in training, not in informing."

"We must counteract the natural tendency of purely professional studies—the tendency to limit the range of mental vision. We can do this most beneficially through the collateral sciences, which are sufficiently different to give them a wider sphere of action. It is from this point of view that we should regard the natural history sciences as branches of medical education. For my part," continues Forbes, "after much intercourse with medical men who had studied at many seats of professional education, some collegiate, some exclusively professional, I have no hesitation in saying that, as a rule, the former had the intellectual advantage. There are noble and notable exceptions old and young, but the rule is true in the main. The man who has studied at a seat of learning, university or college, has a wider range of sympathies, a more philosophical tone of mind and a higher estimate of the objects of intellectual ambition, than his fellow-practitioner who, from his youth upwards, has concentrated his thoughts upon the contracted professional subjects of an hospital school. I will not believe that the practitioner of medicine, any more than the clergyman, or the lawyer, or the soldier or merchant, is wiser, or better able to treat the offices of his calling, because his mind takes no note of subjects beyond the range of his professional pursuit. It is a great pleasure, both to patient and neighbourhood, to find in our doctor an enlightened friend, one who, whilst he does his duty ably and kindly, has a sympathy and an acquaintance with science, literature, and art."

In Scotland a university is not merely a board authorised to examine students and grant degrees, it is an educational institution, intended to exercise a surveillance over the studies of youth, to train their minds for the proper acquisition of knowledge, and to direct their energies in such a way as to insure that mental culture which will fit them for all the duties of life. We speak of our University in Scotland as our *Alma Mater* because she acts the part of a mother to her *alumni*, educating them and superintending their progress in liberal studies.

It appears to me that a great injury would be inflicted on the character of our medical degrees if the required curriculum did not embrace the natural sciences. To study these properly something more than books is required. There must be practical training under an able teacher, examination of living objects both with the naked eye and with the microscope, and a certified course of study. I am sure that everyone, in Scotland at all events, who desires to make graduation in medicine a University honour will aid in keeping up a scientific curriculum under qualified teachers.

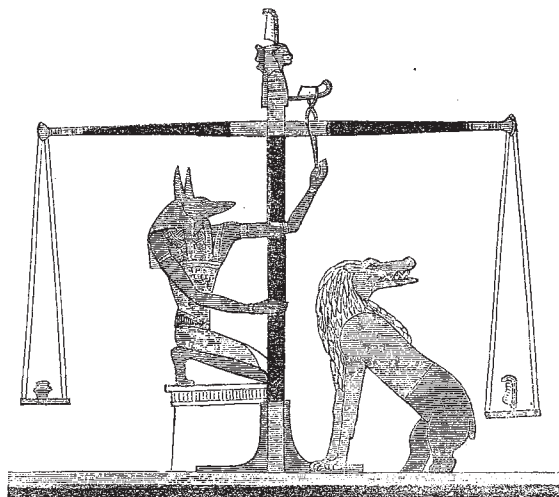
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JOHN H. BALFOUR

Ancient Egyptian Balances

I HAVE to thank Mr. Rodwell for calling my attention, in *NATURE*, vol. ix. p. 8, to the curious representation of an

equal-armed Egyptian balance in a papyrus, now in the British Museum. This papyrus, which is perhaps the most beautiful in the whole collection, all the colours and lines being as bright and distinct as when originally painted, has been shown to me by Dr. Birch, who also informed me where I could procure a photograph of it, being one of a series of photographs from the collection at the British Museum, taken by S. Thompson, and published by Mansell and Co., 2, Percy Street. By Mr. Mansell's permission the following drawing has been made.



From an ancient Egyptian papyrus in the British Museum, of Hennefer, superintendent of the cattle of Seti I., 19th Dynasty, about 1350 B.C., representing the "Ritual of the dead." The heart of the deceased is being weighed in an equal-armed balance, and found lighter than a feather. In the papyrus, the weighing is being made in the Hall of perfect Justice, in presence of Osiris.

It may be seen that what Mr. Rodwell mentions as a sliding weight on one side of the beam, appears rather to be a loop or ribbon for limiting the oscillation of the beam. In the original papyrus the middle and both ends of the beam, as well as the lower part of the column, are coloured to represent polished brass, whilst the other parts of the balance are dark, as if of bronze. It should be observed that the balance beam has box-ends for suspending the pans. Judging from the height of the human figures, the length of the balance beam represented is about six feet, and the height of the column of the balance is nearly the same. Several similar, though rougher, representations of weighing the heart of the deceased may be seen in the papyrus drawing on the staircase leading from the Egyptian sculpture room to the upper Egyptian room in the British Museum.

H. W. CHISHOLM

Stalagmitic Deposits

In a former number of *NATURE* (vol. viii. p. 462), Mr. A. R. Wallace, in reviewing Sir Charles Lyell's last edition of the "Antiquity of Man," makes use of the rate of deposits of stalagmite as data for ascertaining the age of animal remains which are found buried in caves. It is evident that the variations of rate will render unreliable data for arriving at correct conclusions; still, calculations based thereon may be of service.

Some thirty years ago I procured a piece of lime deposit from a lead mine at Boltsburn, in the county of Durham; it measured about 18 in. in length, 10 in. in breadth, and fully $\frac{1}{2}$ in. thick; it was compact and crystalline, and showed distinct facets of crystals on its surface, over which the water was running. I had indisputable evidence that the deposit had taken place in fifteen years. The water, from which it was produced, issued from an adit driven in the Little limestone, which is about 9 ft. thick. After leaving the adit, the water ran down the perpendicular side of a rise, for some fathoms, on to some rock *debris*, which was lying on the bottom of a hopper, whence it proceeded from the upper part of the hopper mouth, then perpendicularly down over two narrowish wood deals, which were set on edge, and put across the mouth of the hopper to retain the worked materials. It was from off these deals that I obtained the specimens above described. On its back side the forms of the deals

were well defined; on the front one the crystals were best developed where the stream was most active.

In accordance with the above rate of increase of deposit, namely, $\frac{3}{4}$ in. in fifteen years, 5 in. would require 100 years, 4 ft. 2 in. 1,000, and 41 ft. 8 in. 10,000 years. The data given to arrive at these results may be relied on as being accurate. In the case now related, the rate of increase of deposit was likely to continue tolerably uniform; as the surface water could have no appreciable influence in augmenting or lessening the flow from the adit.

Boltsburn, Nov. 26

JOHN CURRY

Shooting-stars in the Red Sea

ON my way to India, in November 1872, I witnessed in the Red Sea the splendid phenomenon of a star-drift, a note about which may be of interest, in comparison with the observations at the same time in Europe.

November 24, at 8 P.M., about 600 miles to the south of Suez, I first saw a series of shooting-stars falling from about 70° W.N.W., but not in such a quantity that my attention was much attracted; I only made a note about it in my diary.

In the night of the 25th-26th I noticed nothing particular, but in that of the 26th-27th again many shooting-stars were to be seen.

But in the night of the 27th-28th, about 100 miles to the west of Aden, the phenomenon reached its height. Through the whole night many thousands of shooting-stars were falling from every quarter of the heavens, and in all directions. It was impossible for me to count the average number falling in one minute, although I tried several times to do so, because the eye could not be everywhere, and the shooting-stars did not come from one point only. I sat the whole night on deck, to witness this sublime phenomenon of nature, which certainly was far more splendid here in the tropics than in Europe, on account of the generally greater brightness of the stars in these latitudes.

A. B. MEYER

Cuckoos

IN vol. v. p. 383 of NATURE, you were so good as to publish a note of mine, in which I tried to describe exactly all that took place when I saw a young cuckoo throw a young pipit out of the nest.

I am much flattered to find that Mr. Gould has thought my note fit to be transferred to the introduction of his magnificent "Birds of Great Britain," and a rough sketch of mine worthy to be made the foundation of one of his large coloured plates. As, however, I have always tried in my drawings of facts in natural history to express neither more nor less than what I saw, I think it right to say that I am not the authority for many of the details in the large plate.

None of us saw the parent pipit looking on while the young cuckoo behaved so naughtily; we saw only two young pipits besides the young cuckoo, and no egg-shells. The young cuckoo was absolutely naked and blind, the young pipits partly fledged and bright eyed.

One curious point I tried to call attention to in my former note in these words:—"The nest . . . was below a heather-bush on the declivity of a low abrupt bank . . . The most singular thing of all was the direct purpose with which the blind little monster made for the open side of the nest, the only part where it could throw its burthen down the bank." This peculiarity my rough sketch could not, and Mr. Gould's plate does not, express.

J. H. B.

ASTRONOMICAL ALMANACS*

VII.—Continuation of the History of the "Nautical Almanac."

UNTIL towards the end of the life of Maskelyne, its founder, the *Nautical Almanac* had the approbation of the English, and knew how to deserve the praise of foreigners; it was, according to Lalande, the most per-

fect ephemeris that had ever existed.* But, in 1808, death deprived Maskelyne, who was then about 76 years of age, of his pupil and industrious collaborateur, R. Hitchins, upon whom he had depended for ten years for the most important part of his work, the verification of the calculations, and who was during that time the real editor of the *Nautical Almanac*. The advanced age of Maskelyne no longer permitting him to undertake any active occupation, the work passed into irresponsible hands, the calculations fell into great confusion, and "while astronomy advanced, the *Nautical Almanac* remained stationary, and even retrograded."† Maskelyne died shortly afterwards, in 1811, and Brown of Tiedeswill (Derbyshire), was appointed to succeed him. The new director did not improve the *Nautical Almanac*, and English mariners and astronomers complained loudly; a reform was necessary. The Board of Longitude being incompetent to improve the work of which it had charge, Government abolished that body in 1818, by advice of the Admiralty, to which the publication of the work was entrusted, and which replaced the former body (which numbered sixteen members) by another much less numerous.

This new Board of Longitude was ingeniously formed; it was composed of a Resident Committee "of three persons well versed in mathematics, astronomy, and navigation, nominated by Government," to which was added, a Commission of the Royal Society, consisting of the president and three members, charged to support it, and, if need be, to control it. The members of the resident committee had to live in London, or its neighbourhood, and to lend their aid to the Commissioners of the Royal Society for the scientific questions within the domain of the Commission. They received a salary of 100*l.*, and the secretary of the committee, who was charged with the publication of the *Nautical Almanac*, a salary of 500*l.* Captain Kater, Dr. Wollaston, and Dr. Young were appointed resident members, and the latter, the secretary of the committee, had the editorship of the *Nautical Almanac*.

Young did much to improve the work, to restore to it the reputation for accuracy which Maskelyne had given it, and to render it capable of satisfying the constantly increasing wants of navigation. Thus, he introduced into the *Almanac*, in 1822, the apparent position, for every ten days, of twenty-four fundamental stars, which number was increased to sixty in 1827; mariners had thus constantly at their command the exact position of their reference points. Moreover, it is to him that we owe the publication of the elements by means of which we can predict occultations of stars by the moon, phenomena so useful to astronomers on an expedition, and to sailors whose ships are in a foreign harbour.

But these improvements were by no means the only ones which English astronomers and mariners demanded; as it was, the *Nautical Almanac* satisfied neither the one nor the other of these; sailors stood in need of the ephemerides and planetary distances of Schumacher, and astronomers of the supplement to these ephemerides.‡ Moreover, it often happened that these ephemerides appeared too late to be of any service to mariners who were setting out on a long voyage. Thus Young was exposed to criticism, very just, no doubt, but sometimes extremely violent. The result was an excessively sharp controversy, which, although sustained by most of the English

* "Correspondance astronomique francaise," of Baron de Zach, vol. iv. pp. 87, et seq.

† Sir James South's Address to the Royal Astronomical Society, February 12, 1830.

‡ The first of these ephemerides was due to the Baron de Zach, and Rear-Admiral Höverörn caused them to be adopted by the Danish Governor in 1800. The Director of Copenhagen Observatory, Thomas Bugge, was then entrusted with their editorship; they were continued by Schumacher, and a little later were published, partly at the expense of the British Government. They gave the position of the planets Venus, Mars, Jupiter, and Saturn for every day in the year, and their distances from the moon every three hours.

* Continued from p. 70.